

# 'The Life Cycle of *Chrysodeixis chalcites* (Esper) (Lep., Noctuidae: Plusiinae), and an Account of the Breeding Techniques Used

By D. R. STEPHENSON \*

I have already recorded (*antea* 91: 269) the fact that on the 8th October 1979 I captured a single female specimen of *Chrysodeixis chalcites* in my garden M.V. trap. The moth was kept alive in a breeding cage and on the 9th October deposited approximately 60 eggs singly around netting of the cage. On the following evening approximately the same number of eggs were laid and the moth was taken then killed and set, still in a reasonably good condition.

## The Ova

The ova are pale green, inclining to white, and are shiny in appearance. They are flattish and hemispherical in shape with a wide flat base, delicately ribbed and reticulated. They were removed from the cage by cutting the netting and were then placed in a small plastic container and kept at a temperature of approx. 65°F. They were inspected twice daily for signs of hatching and on the 16th October the micropyle darkened considerably and this was the first real

indication I had observed which verified their fertility. On the 17th October the eggs darkened in colour and the following day all the eggs hatched except for about 35 which must have either been damaged or infertile. Ten of the eggs were given to Dr. Neil Horton whom I have recently had the pleasure of meeting and, I believe, nine of these hatched successfully.

## The Larvae

The 75 newly hatched larvae were semi-transparent inclining to white, each segment being very pronounced, and tapering to the head which was black. The thoracic legs were also black. They were kept initially at room temperature (60°F.) and fed readily on *Urtica dioica* — The Common Stinging Nettle. According to South (*The moths of the British Isles*, Vol. I) the larvae also feed on *Salvia* and *Echium*.

During the initial stages of the larvae I had to go to Gt. Yarmouth, Norfolk with my wife and son so I potted some nettle and covered the nettle and pot with a plastic freezer bag and punctured it several times with a pin to allow for condensation, however this was to be a problem and the top end of the bag had to be cut open in order to minimise the moisture content. Fortunately the larvae were quite content to remain on the foodplant and showed no signs of wandering. They all remained on the underside of the leaves in a looped position and nibbled from the centre of the leaf outwards. This tendency remained until the larvae

\* "The Haven", St. Mary Church, Cowbridge, S. Glamorgan. S. Wales.

were at least 16 mm. in length when they started to eat from the outer edge of the leaf inwards.

On the 25th October two larvae died, I believe during the skin change. I was very concerned about the possibility of disease but I only lost two more larvae, again during the skin change on the 5th November. Upon my return to South Wales the larvae were large enough to transfer to a larger cylindrical rearing cage. I used potted nettle as I was concerned that there may be a harsh frost which would probably deplete the nettle population in the area. This, fortunately was not to be, and the foodplant was abundant up to the time of pupation. I kept 15 larvae in a separate container so as to minimise the chances of losing all to disease. For the remainder of the larval stage they were kept in my airing cupboard at a temperature of 68°-78°F.

Following their 1st instar, the larvae were green but still semi-transparent, and the spiracles were black. The shade of green was constant and the larvae blended remarkably with the nettle leaves. The head was pale tan in colour and the thoracic legs black. They were similar after the 2nd instar but following the 3rd instar the larvae were no longer semi-transparent and the green stading became darker. Their length at this stage was 20 mm. on average and they were much plumper in appearance. The spiracular band was of a darker green in contrast to the general green colouring of the larvae.

The final instar larvae measured 25-28mm. in length just prior to pupation and the segments were far less pronounced when compared to 1st instar larvae. The overall shape indicated a gradual taper from the anal end to the head. Situated along the back were sparsely spread obscure warts from which emanated 3 or 4 bristles of short, fine, hair. The head was greenish brown dotted with small black warts. The spiracular band was white, broad and continuous but narrowing from the tenth segment to the anal flap. This band is located just beneath the black spiracles. The general colouration of the larvae was green. There was a pronounced dark green line running the full length of the back, and parallel to this, and each side of it were 3 wavy white bands, the central one on each side being the broadest. These two broader lines were broken in the centre of each segment by a green ring and in the middle of each ring was a white dot. Between the lowest of these wavy white lines and the spiracular band is a broad dark green band. The anal angle is sharply pronounced and falls away steeply from the last segment to the anal claspers. Just prior to pupation the larva becomes shorter and plumper and the ground colouration becomes generally paler and the markings less pronounced.

At the final count, 57 larvae were full grown and ready for pupation. I placed plenty of peat in the bottom of the rearing cylinder and added some pieces of bark. Both of these sites were completely ignored and on the 7th November

1979 the larvae began spinning a delicate pure white web on the corners of the plastic top of the cage. This spinning process took about 12 hours to complete. The cocoon is so delicate that the larvae were clearly visible inside. After another 36 hours the transformation to pupae had taken place. After space was no longer available around the lid the larvae started spinning on the sides of the cylinder. Two of these spun such tight cocoons that the pupae were, in fact, crushed and deformed, and failed to hatch. Twenty larvae enclosed themselves within the leaves of the nettles by folding over the leaf edges. Unfortunately whilst these were hatching I did not initially notice that the moths could not free themselves from the folded leaves which resulted in six cripples, but upon observing this I cut a hole in the ends of the leaves so that the imagoes could crawl free easily to expand their wings.

I should perhaps state at this stage that although the larvae were relatively overcrowded, no acts of cannibalism were observed, only a twitching or thrashing action of the body when a larva was touched by another. When the larvae were nearly full grown they ate so rapidly that four large nettle plants would disappear overnight, and this made the job of caring for these creatures considerably time consuming. Full credit must go to my wife and son for being so patient with me during this time!

### The Pupae

The pupae are a pale shade of green over their entirety for the first two days after pupation. They then make a remarkable transformation. Observing the pupae from a ventral aspect of the wing cases become a golden-brown colour, lighter at the head end and darker at the base, with a centrally positioned pale green patch next to the antenna. The abdomen is pale green blotched with brown on each segment. The wing cases join the antennae and legs to cover ventrally all of the 3rd abdominal ring and most of the 4th, and this reaches almost two-thirds of the total body length. The cremaster consists of a number of brown bristles.

The dorsal aspect of the pupae shows the head and eye cases brown, the thorax black, and segments 1, 2, 3, 4, 5, almost entirely black, except for a narrow green edging. Segment 6 has a black triangular shape with the point of the triangle facing towards the anal end. Segments 7 & 8 are green with brown markings. The final two segmental joints are black (anal end) and the next two are greenish-brown. The total length of the pupae measured 20 mm. (13 mm. from tip of head to bottom end of wing case and 7mm. from bottom top of wing case to cremaster.).

The final larvae pupated on the 10th November 1979 on some black fine mesh, this having been introduced to the cage to allow more space for pupation. From the start of spinning the cocoon to the complete transformation to

pupae took 48 hours approx. The pupae were kept in the airing cupboard at 68°-80°F and were sprayed with water twice daily so that moisture was always present. Twigs were placed in the rearing cage so that the environment was suitable for wing drying. On the 17th November the wing pattern could be seen clearly through the pupal wing cases and the lower abdominal segments turned a pinkish-brown colour with no green colour remaining.

4	<i>chalcites</i>	hatched on the	18th Nov	3 males	1 female
4	"	"	" " 19th "	2 "	2 "
6	"	"	" " 20th "	4 "	2 "
6	"	"	" " 21st "	4 "	2 "
15	"	"	" " 22nd "	9 "	6 "
15	"	"	" " 23rd "	8 "	7 "
<hr/> 50 total				<hr/> 30 "	<hr/> 20 "

30 specimens were killed and set in perfect condition. six were crippled and 14 kept for breeding purposes. Mating was not observed for some 10 days after hatching and difficulty was experienced in finding the right conditions. Cool and warm temperatures were tried but seemingly to no avail unless mating took place in the early hours of the morning. A mixture of honey and sugar was introduced to the cage and the moths fed on this readily. The soaked cotton wool pad was fought over by the moths and they lived for well over a month in the cage.

I found two pairs mating and transferred these to a rearing cage. After several days a large series of eggs were laid, and at least 200 must have hatched. Unfortunately it was at a time when I had many other commitments and time was scarce. I had to release most of them to the wild but no doubt they will not survive the rigours of our winter, but at this moment I have about 25 larvae in my rearing cage and they are all healthy. I hope to breed again in the summer when I shall be able to sleeve the larvae on growing plants outside.

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**LASIVS FULIGINOSUS (LATREILLE) (HYMENOPTERA: FORMICIDAE IN BUCKINGHAMSHIRE.** — Having recently received a copy of the new (1979) edition of the *Ants*, Part 5 of the Biological Records Centre's *Provisional Atlas of the Insects of the British Isles*, it occurs to me that I ought to place on permanent record the discovery of a small colony of the large shiny black ant *Lasius fuliginosus* at Stone, Bucks., on June 7, 1979 (Map ref. SP 792123). The ants were on a single nettle plant, among a clump of others, on a dense grassy path verge and were tending a densely-packed colony of dark green aphides. My identification was subsequently confirmed by Dr. M. V. Brian of the Nature Conservancy's Furzebrook Research — ANTHONY WOOTTON, Stone, Bucks.